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Patentanmeldung Nr. Patent application No. Demande de brevet n°

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Blatt 2 der Bescheinigung
Sheet 2 of the certificate
Page 2 de l'attestation

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GRANULATED BREAD IMPROVER FOR THE PREPARATION OF BAKERY
PRODUCTS

10

Field of the invention

The present invention is related to a granulated bread improver for the preparation of bakery products, and to the bakery products comprising said
15 improver.

The present invention is also related to the preparation process of said granulated bread improver.

Background of the invention and state of the art

20

Baked bread products are made of the basic ingredients: flour (mostly wheat or rye flour), water, salt and yeast. Other types of flour (barley, oats, soy, sunflower, cassava and other). The process of baking is subject to a lot of variations due to external
25 (temperature, humidity, handling) and internal (variations of flour and yeast quality) factors.

To obtain a more reliable production process and a constant end product the baker uses ingredients and additives. These products are mostly added as one
30 coformulated product and are known as improvers. These improvers may contain emulsifiers and fats, enzymes, sugars, organic acids, minerals, polysaccharides and

This effect is more pronounced at higher temperatures. As a result of its poor free flowing characteristics, the improver is not easily carried by automatic dosing systems and tends to get stuck in the
5 pipes. This also makes dosing inaccurate, and makes the cleaning of the pipes arduous. In addition, a flour which contains a lot of small particles may give rise to allergic reactions for sensitised persons, for instance as in
10 baker's disease which is well known to be caused by allergenic wheat flour particles and by the powdered additives.

In various fields, it has been proposed to increase the particle size of various compositions.

The enzyme producers have granulated their
15 enzymes to reduce this risk of allergenicity as illustrated in the US Patent US-4,940,665.

The International Patent Application WO93/07260 describes the manufacturing of dust free particles of enzymes by spray-coating solid particulate
20 cores.

The European Patent Application EP-A-0289069 describes also oil or fat obtained in a granular form.

The European Patent Application EP-A-0659344 describes a dry yeast composition consisting of dry
25 inactive yeast and a bread improving agent which is preferably in a granular form or consists of small particles adhering larger yeast granules. This European Patent Application also describes a process to obtain a mixture of hemicellulase, amylase and Vitamin C in a
30 granular form.

One might try to overcome the disadvantages of a powder form improver by applying the teaching of the

General description of the invention

The present invention is related to a bread improver in the form of a powder which is made of agglomerated particles having a mean particle size of at least 250 μm . The mean agglomerated particle size of this product is preferably comprised between 300 and 2000 μm .

Preferably, the standard deviation /mean agglomerated particle size ratio is lower than 0.8, preferably lower than 0.65 .

10 In a preferred embodiment of the present invention, the particles are made of at least 2 different active ingredients, advantageously balanced to obtain an effect in bakery products.

The improver according to the invention can further comprise one or more ingredients selected from the group consisting of emulsifiers, fats, enzymes, sugars, organic acids, minerals, polysaccharides, proteins and/or a mixture thereof.

20 A second aspect of the present invention is related to a method for obtaining the granulated improver in the form of a powder according to the invention, said method comprising the steps of :

- preparing a starting material being a bread improver in the form of a dried powder having a mean particle size lower than 200 μm ,
- introducing and maintaining said starting material in a fluidised bed reactor, under spraying of an atomised liquid, in order to obtain an agglomeration of the dried powder particles of said material, and
- 30 - recovering a bread improver in the form of a dried powder made of agglomerated particles having mean particle size of at least 250 μm .

certain temperature, but even before this temperature is reached, an emulsifier tends to become sticky and will cause unwanted lumping in the improver. This means that the improver temperature during granulation must be kept under
5 this melting temperature.

Moreover, emulsifiers are sensitive to moisture.

The dry improver may also contain other ingredients that are unstable in water or that tend to
10 react with other ingredients present in the improver. As an illustration one can mention the reaction between bromate and cysteine. Therefore the moisture content must be kept low during the entire granulation process.

The granulation step is followed by measuring
15 the particle size distribution by using the Coulter LS 200 Particle Analyser.

The bread improver powder is introduced in the granulating device. Warm air, preferably dried, is blown through the powder as to fluidise it. The air flow is
20 such that a stable fluidised bed is obtained. This result is measured and determined by a person skilled in the art according to bed expansion and movement of the particles in said fluidised bed. The temperature of the fluidised bed has to be lower than 45 °C. Preferably it is lower than 40
25 °C. The lower limit is defined by the evaporative capacity of the air and is usually higher than 25 °C. Once the fluidised bed is stabilised, water or preferably an aqueous solution containing an agglomerating material is sprayed on the fluidised bed. This step is usually called "topspray".
30 It is also possible to granulate using the "bottom spray" method (also called the "Wurster process"). The aqueous

speed about 3.5 m/s. Bed temperature was maintained at about 29 °C. It fluctuated between about 26 °C and 32 °C. Process time was about 75 minutes. In this period 3.8 g of guar was sprayed on the product.

5 In the figure 1, it is shown that the average particle size distribution is considerably increased by the granulation process. In all figures, (1) indicates the particle size distribution prior to the treatment, while (2) shows the particle size distribution after the
10 agglomeration treatment according to the invention.

Example 2 : Baking experiments

Baking tests of Belgianpistolets were performed using the following method. The ingredients used
15 in the four experiments as specified in Table 1 are all expressed in grams :

Table 1 : Ingredients for baking tests 1 to 4

Ingredients	Test 1	Test 2	Test 3	Test 4
Wheat flour	1500	1500	1500	1500
Water	930	930	930	930
Yeast	90	90	90	90
Salt	30	30	30	30
Non-granulated S500	30		45	
S500 after granulation experiment 1		30		45

20 After mixing to optimum dough development (Diosna spiral mixer), the dough was allowed to rest for a total time of 25 minutes, then the dough was divided in 66 g dough pieces (Eberhardt divider) and allowed to rise

Example 4 : Industrial granulation of improver

The industrial granulator was a WSG 120-200 from Glatt - Binzen(Germany) equipped with 3 nozzles. The granulated product has the following composition :

5	dextrose	: 50 kg
	DATEM in powder form	: 25 kg
	dry wheat flour	: 117.5 kg
	pre-diluted hemicellulase	: 3.75 kg
	pre-diluted alpha-amylase	: 3.76 kg

10 The enzymes were prediluted in wheat flour to facilitate a reproducible mixing. The ingredients were mixed and introduced in the granulation bowl. A solution of 0.66% guar in water was used as the spraying solution at a spray rate of about 25 l/h. The atomisation pressure in
15 the nozzles was about 2 bar. Air inlet temperature varied between 20 and 75 °C. The inlet air flow was about 3800 m³/h. Bed temperature was set at about 30 °C. It fluctuated between 27 °C and 35 °C. Process time was about 80 minutes. In this period, 0.5 kg of guar was sprayed on the product.

20 Figure 3 and 4 and Table 3 show that starting from a particle size distribution with at least 3 different populations, the product obtained after 80 minutes presents a uniform distribution, with an increased mean particle size.

25

Summary of results

Results are expressed before and after granulation in the Table 3.

30

CLAIMS

1. Bread improver in the form of a powder, characterised in that it is made of agglomerated particles having a mean particle size of at least 250 μm .
- 5 2. Improver according to claim 1, characterised in that the mean agglomerated particle size is comprised between 300 and 2000 μm .
3. Improver according to claim 1 or 2, characterised in that the standard deviation/mean
10 agglomerated particle size ratio is lower than 0.8, preferably lower than 0.65 .
4. Improver according to any of the claims 1 to 3, characterised in that the particles are made of at least fat and proteins.
- 15 5. Improver according to claim 4, characterised in that the particles further comprise ingredients selected from the group consisting of emulsifiers, enzymes, sugars, organic acids, minerals, polysaccharides and/or a mixture thereof.
- 20 6. Improver according to the claim 4 or 5, characterised in that the particles further comprise a carrier, preferably selected from the group consisting of starch, wheat flour soy flour.
7. Method for obtaining the granulated bread
25 improver according to any of the preceding claims, said method comprising the steps of :
 - preparing a starting material being a bread improver in the form of a dried powder having a mean particle size lower than 200 μm ,
 - 30 - introducing and maintaining said starting material in a fluidised bed reactor, under spraying of an atomised liquid, in order to obtain an agglomeration of the dried

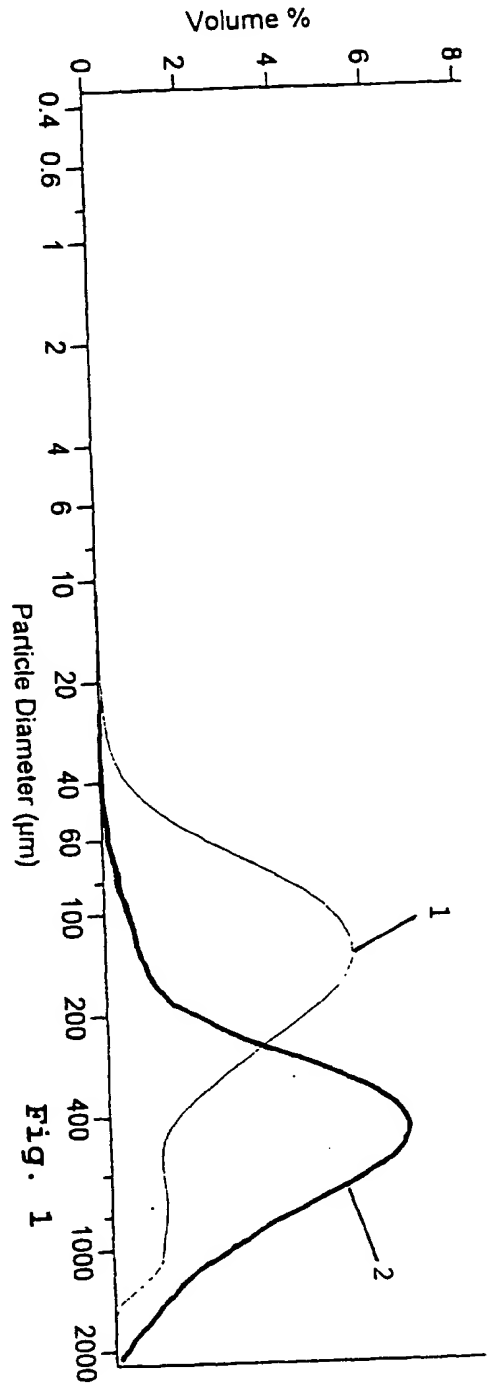


Fig. 1

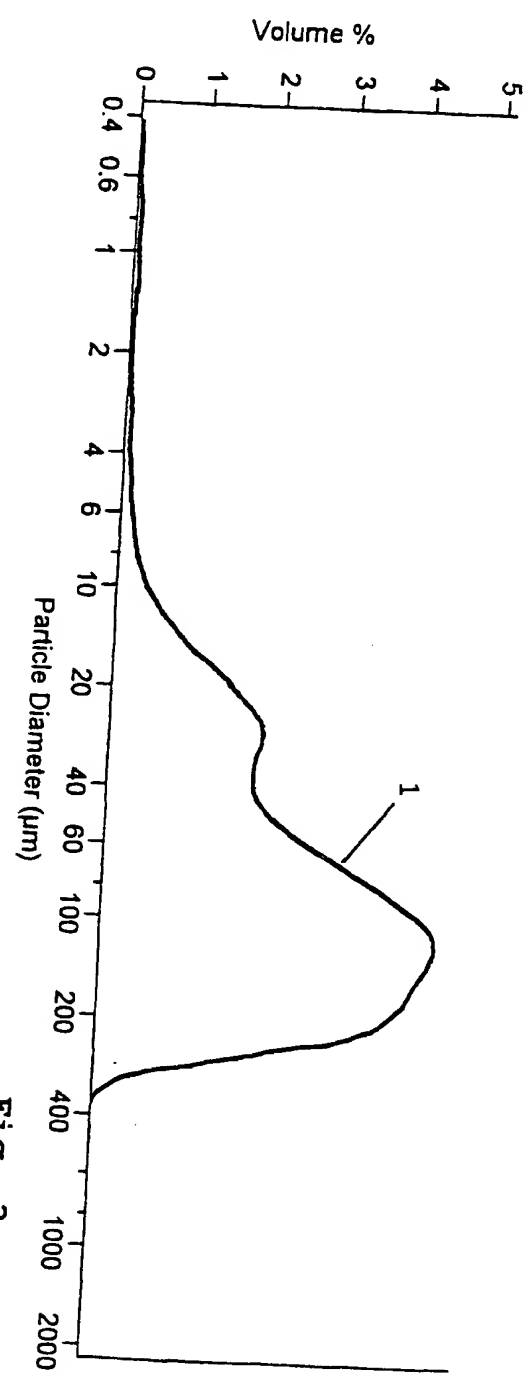


Fig. 3

ABSTRACTGRANULATED BREAD IMPROVER FOR THE PREPARATION OF BAKERY
PRODUCTS

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The present invention is related to a bread improver in the form of a powder, characterised in that it is made of agglomerated particles having a mean particle size of at least 250 μm .

10

The present invention is also related to the preparation method of said bread improver.

(Figure 1)